Reinventing 5 A Day Tested Interventions with Technology

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Abbreviated Abstract

Emerging Internet-based technology has vast potential to extend cancer prevention communications and interventions widely through corporate wellness markets. Computer based-tolls for worksite health promotion offer the potential for significantly increasing the accessibility of programs and breadth of option that employers can provide. In this Phase II project, Klein Buendel, Inc. produced an Internet-accessed multi-layered 5 A Day corporate health promotion program with resources for worksite wellness professionals and educational interfaces and communication features for employees and test its effectiveness. A randomized controlled trial with employees and worksite wellness professionals in companies nationwide tested the effectiveness of the web-based 5 A Day Program at increasing consumption of fruits and vegetables and its efficacy for Phase II commercialization.

Primary Investigator

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Mary Buller, MA, is President of Klein Buendel, Inc. and an experienced Principal Investigator. She has nearly 20 years of experience in cancer prevention research from clinical trials to the latest multimedia technology. Since 1998, she has been the P.I. on multiple SBIR Phase I awards and Phase II awards to develop prototype CD-ROM programs to educate elementary and middle school children about sun safety and skin cancer prevention, 5 A Day nutrition and to develop computer-based programs to disseminate the 5 A Day nutrition education program to worksite wellness professionals and employees via the Internet, among others. Ms Buller is author or co-author of 20 published peer-reviewed articles and has been a speaker at dozens of professional conferences.

Research Team & Affiliations

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Total Budget

$1,434,077

Research Objectives

Aim 1: To produce a multimedia web-based worksite nutrition education program with on-line health promotion training, nutrition education resources and interactive communication features for worksite health professionals and on-line dietary assessments, nutrition education modules, and interactive communication features for employees.
Aim 2: To recruit 32 corporate wellness programs to participate in a randomized trial in Part 2 and assess their computer hardware and software capabilities and Internet access technology.
Aim 3: To evaluate the ability of the web-based program to improve the 5 A Day activities of worksite wellness professionals, including increasing communication and social support among worksite wellness professionals, knowledge of 5 A Day resources available for worksite wellness programs, number of 5 A Day activities included in the worksite wellness program, and commitment to a worksite 5 A Day program for cancer and disease prevention.
Aim 4: To test the effectiveness of the web-based 5 A Day program at increasing consumption of fruits and vegetables by employees in intervention companies as compared to a control group of companies not receiving the program.

Theory/Hypothesis

Several theoretical frameworks guided the production of the web program: the PRECEDE/PROCEED Model, Social Cognitive Theory, the Transtheoretical Model, Diffusion of Innovations Theory, and Social Comparison Theory.

Experimental Design

Pretest-posttest group randomized design, with worksites as the unit of randomization. Ten worksites were randomized to the intervention condition, 10 worksites randomized to control condition (no website exposure).

Final Sample Size & Study Demographics

Twenty-four employees were pretested at 20 worksites for a total of 480 consented and pretested employees. At follow-up 412 employees completed posttests (an 86% retention rate). The baseline sample (n=480) was 67% female and 33% male aged 21-73 years. For race, 2.29% reported Native American/Alaska Native; 3.33% reported Asian; 6.04% reported Black/African American; 0.83% reported Native Hawaiian/Other Pacific Islander; 84.17% reported White; 1.25% reported “Don’t Know;” and 2.08% were Refused/Unknown. For ethnicity, 89% reported Not Hispanic; 10% reported Hispanic, and 1% reported unknown.

Data Collection Methods

A telephone survey was administered by interviewers from the Cooper Institute's Survey Research Unit. The pre- and posttest interviews were approximately 20 minutes long.

Outcome Measures

The effectiveness of the 5 A Day @ Work program was evaluated on changes in daily servings of fruits and vegetables. A 19-item food frequency questionnaire assessed fruit and vegetable intake. In addition, several secondary outcomes such as knowledge and awareness of fruit and vegetable consumption, Stage of Change, beliefs and benefits of 5 A Day, self-efficacy towards eating fruits and vegetables, social support for eating 5 A Day, helps and barriers related to consuming fruits and vegetables were also measured. In addition, intervention subjects were asked questions on website usability and satisfaction at posttest.

Evaluation Methods

Changes in outcomes were analyzed using hierarchical clustered analysis, adjusting for the effect of clusterings (i.e. association of responses by adults within the same worksites) using PROC MIXED (for continuous variables) and PROC GENMOD (for dichotomous variables) in SAS.

Research Results

The primary outcome of fruit and vegetable intake was measured in two ways: by a multiple-item fruit and vegetable food frequency questionnaire and by a one-item self-report question. Adults in workplaces assigned to receive 5 A Day @ Work did not significantly increase fruit and vegetable intake, although the trend is in the expected direction when analyzing results from the multiple-item food frequency questionnaire. Adults randomized to receive 5 A Day @ Work reported eating more servings of fruits and vegetables each day with a one-item self-report. Regarding website usage, it appears that 5 A Day at Work was offered to two groups of employees: Employees who did not believe they needed it, so they did not use it and employees who believed they needed it, so they used it.

Barriers & Solutions

A number of unexpected barriers inhibited worksites' ability to sign-on as participants in our research study. Barriers to enrollment in the study included privacy concerns, a lack of wellness staff during a time of economic downsizing, and technology limitations. Solutions to these challenges included reducing the sample size and creating a rolling implementation schedule to allow more time for worksite recruitment and start date flexibility. Ultimately 20 worksites were secured for participation in the study compared to the 32 worksites that were anticipated to participate based on what was written into the original study design. Although enrollment was lower, the co-investigator biostatistician was able to adjust the design and statistical power with the lower number of worksites.

In addition to the challenge of recruiting eligible worksites for the study, we encountered three other barriers that required solutions. First, multimedia development was very time-intensive, so we scaled back on certain interactive features. Second, due to time and resource constraints, we needed to train the worksite wellness staff from a distance. As a solution, we developed a combination online-

conference call training program which worked very well. Third, motivating worksite wellness staff to promote the website within their organizations provided to be challenging. As an aide, we developed an email reminder system to remind worksite wellness staff to promote the website.

Product(s) Developed from This Research

5 A Day @ Work